AMENDMENTS TO THE CLAIMS

1.   (Currently Amended) A method for fault diagnosis in a ~~vehicle~~transport device

comprising the steps of:

partitioning a ~~vehicle~~transport device model into a plurality of subsystems,

each subsystem comprising one or more modules;

associating a fault detector unit with each module in each subsystem;

defining a residual evaluation method for each subsystem;

evaluating data from said fault detector units in accordance with said

residual evaluation method for each subsystem; and

diagnosing a fault in accordance with said evaluated data.

2.   (Original) The method of claim 1 wherein the step of defining a residual

evaluation method for each subsystem comprises the step of defining a residual

evaluation method selected from the group consisting of parity space method,

observer method, and parameter identification method.

3.   (Currently Amended) The method of claim 1 wherein the step of partitioning a

~~vehicle~~transport device model into a plurality of subsystems comprises the step of

partitioning said ~~vehicle~~transport device model into a core subsystem and an

external subsystem.

4.   (Currently Amended) The method of claim 3 wherein the ~~step of partitioning said~~

~~vehicle model into a~~ core subsystem comprises ~~the step of partitioning said~~

~~vehicle model into~~ a ~~vehicle~~transport device dynamics module, a tire module, a

powertrain module, a steering module, a suspension module, and a brake

module.

5.   (Currently Amended) The method of claim 3 wherein the ~~step of partitioning said vehicle model into an~~ external subsystem comprises ~~the step of partitioning said vehicle model into~~ an environmental module, a driver module, a sensor module, a brake controller module, a suspension controller module, and a communication module.

6.   (Currently Amended) The method of claim 3 wherein said subsystem modules are selected from the group of modules consisting of vehicle, tire, powertrain, steering, suspension, brake, environmental, driver, sensor, brake controller, suspension controller, communication, engine controller, fuel, air intake, combustion, exhaust, crank-shaft, transmission, coupling, supervisory controller, electric machine, controller, batteries/supercapacitors, tank, pump, servo-value, and cylinder modules.

7.   (Original) The method of claim 3 wherein said plurality of subsystems comprises a handling system, a propulsion system, and an auxiliary system.

8.   (Currently Amended) A system for problem diagnosis in a ~~vehicle~~transport device comprising:

a plurality of residual evaluation units;

a plurality of fault detector units in communication with said plurality of residual evaluation units, each of said plurality of fault detector units adapted to communicate fault data to at least one of said residual evaluation units; and

a supervisor unit adapted to analyze evaluated data from plurality of

residual evaluation units and to diagnose a problem in accordance with said data from said plurality of residual evaluation units.

9. (Currently Amended) The system of claim 8 wherein each of said residual evaluation units evaluates fault data in accordance with a residual evaluation method selected from the group of evaluation methods consisting of parity space method, observer method, and parameter identification method.

10. (Original) The system of claim 8 wherein said plurality of residual evaluation units comprises a brake/suspension/steering residual evaluation unit, a tire/vehicle dynamic residual evaluation unit, and a powertrain/driver residual evaluation unit.

11. (Original) The system of claim 8 wherein each of said plurality of fault detector units comprises a primary residual generator adapted to generate fault data.

12. (Original) The system of claim 11 wherein said primary residual generator is adapted to generate a primary residual representing the error between a measured and calculated variable.

13. (Original) The system of claim 8 wherein each of said residual evaluation units comprises a secondary residual generator, a residual evaluator, and a decision unit.

14. (Original) The system of claim 8 wherein each of said plurality of fault detector units comprises a model associated with a module.

15. (Currently Amended) The system of claim 14 wherein said module is selected from the group consisting of ~~vehicle~~transport device, tire, powertrain, steering, suspension, brake, environmental, driver, sensor, brake controller, suspension

controller, communication, engine controller, fuel, air intake, combustion, exhaust, crank-shaft, transmission, coupling, supervisory controller, electric machine, controller, batteries/supercapacitors, tank, pump, servo-value, and cylinder modules..

16.   (Currently Amended) A ~~vehicle~~transport device comprising:

a first plurality of fault detector ~~unit~~units associated with a first module in said ~~vehicle~~transport device adapted to output ~~a residual~~residuals for said first module;

a second plurality of fault detector units associated with a second module in said transport device adapted to output residuals for said second module;

a first residual evaluation unit adapted to receive and process in accordance with a first residual evaluation method ~~a residual~~said residuals from said first plurality of fault detector ~~unit~~units;

a second residual evaluation unit adapted to receive and process in accordance with a second residual evaluation method said residuals from said second plurality of fault detector units; and

a supervisor unit adapted to receive output from said first residual evaluation unit and said second residual evaluation unit and to diagnose a fault in accordance with said output from said first residual evaluation unit and said second residual evaluation unit.

17.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein each of said fault detector ~~unit~~units comprises a model and a primary residual generator

adapted to generate a residual in accordance with output from said model.

18.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein said first

module is associated with a core subsystem.

19.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein said

second module is associated with an external subsystem.

20.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein said first

module ~~is~~ and said second module are selected from the group of modules

consisting of sensor, brake controller, suspension controller, communication,

brake, driver, steering, ~~vehicle~~transport device, suspension, powertrain, tire,

environmental, engine controller, fuel, air intake, combustion, exhaust, crank-

shaft, transmission, coupling, supervisory controller, electric machine, controller,

batteries/supercapacitors, tank, pump, servo-value, and cylinder modules.

21.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein each of

said residual evaluation ~~unit~~ units comprises a secondary residual generator, a

residual evaluator, and a decision unit.

22.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein said first

residual evaluation method and said second residual evaluation method ~~is~~ are

selected from the group of evaluation methods consisting of parity space method,

observer method, and parameter identification method.

23.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein said first

module is in ~~the~~ a handling system.

24.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein said first

module is in ~~the~~ a propulsion system.

25.   (Currently Amended) The ~~vehicle~~transport device of claim 16 wherein said first

module is in ~~the~~ an auxiliary system.